I-5 / Everett HOV Design-Build Project

REQUEST FOR PROPOSALS

Appendix W1
Wetland Mitigation Plan

Addendum #8:

March 15, 2005

Wetland Mitigation Plan

Interstate 5 Everett HOV, SR 526 to SR 2 Vicinity

Prepared for:

Washington State Department of Transportation

Prepared by:

Sheldon & Associates, Inc

December 29, 2004

Wetland Mitigation Plan

Interstate 5 Everett HOV, SR 526 to SR 2 Vicinity

Prepared for:

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EXECUTIVE SUMMARY

The Washington State Department of Transportation (WSDOT) proposes to construct the Interstate 5 (I-5) Everett high occupancy vehicle (HOV) project from the vicinity of State Route (SR) 526 to the vicinity of SR 2 in Everett, Washington. This will involve constructing northbound and southbound HOV lanes along I-5 within incorporated Everett. In addition, the project includes constructing auxiliary lanes, reconstructing ramps, moving the left-side northbound off-ramp at Broadway to a right-side off-ramp, converting the existing northbound off-ramp at Broadway to HOV-only, adding a southbound HOV-only on-ramp at Broadway, and retrofitting drainage facilities to provide detention and treatment for the entire I-5 facility in the project area.

A total of 25 wetlands were delineated within the project area, which includes the I-5 corridor, the Lowell slide area, and proposed stormwater facilities. The proposed footprint for the new HOV lanes avoids direct wetland impacts, with the exception of two drainage ditches covering 527 square feet that are mitigated separately. The proposed stormwater system for this project includes installation of six water quality treatment facilities.

Direct wetland impacts will occur at one of these six water quality sites during construction. Approximately 1,311 square feet (0.03 acre) of direct impacts to Wetland A and 357 square feet (0.01 acre) of direct impacts to Waters of the U.S. are anticipated to occur at proposed Water Quality Site #1. Mitigation for a total of 0.04-acre of direct impacts to Wetland A and Waters of the U.S. at Water Quality Site #1 will occur through on-site wetland creation. A replacement ratio of 2:1 will be used for a total wetland creation area of 3,336 square feet (0.08 acre). The goal is to mitigate for direct and indirect impacts to existing wetlands by creating replacement wetlands. Wetland creation will occur by excavating an upland area between two wetlands (Wetlands A and B). Upland soils will be excavated and removed to match the elevation of the surrounding wetlands, the underlying soil will be scarified and amended with organic compost, and native trees, shrubs, and emergent species will be planted.

The buffer surrounding Wetlands A and B will be enhanced in three areas. The southwest and east central portion of the Wetland A buffer will be enhanced in two areas, which includes an approximately 33,653 square foot (0.77 acre) and 17,351 square foot (0.40 acre) area. The southwest corner of the Wetland B buffer will be enhanced in a 1,152 square foot (0.03 acre) area. The buffer areas that will be enhanced do not currently provide adequate functions as a sound and visual barrier for wildlife or provide much water quality treatment of stormwater flowing into the wetlands. Buffer enhancement will occur by planting native vegetation between proposed Water Quality Site #1 and the edges of Wetland A and B.

WSDOT uses the principles of adaptive management to guide post-construction wetland management activities. Goals, performance measures, success standards, monitoring methods, maintenance methods, and a contingency plan are provided in this report to improve mitigation success. If monitored performance measures are not met, active site management and the contingency plan will be implemented to correct any potential problems.

1.0 INTRODUCTION

The Washington State Department of Transportation (WSDOT) proposes to construct the Interstate 5 (I-5) Everett high occupancy vehicle (HOV) project from the vicinity of State Route (SR) 526 to the vicinity of SR 2 in Everett, Washington. Interstate 5 (I-5) is a nationally important north to south interstate that runs from the Mexican to the Canadian border. In the state of Washington, it extends along the western portion of the state from the Portland/Vancouver metropolitan area to Bellingham at the Canadian border (Figure 1).

The I-5 Everett HOV, SR 526 to SR 2 Vicinity project (I-5 Everett HOV) will complete the northernmost portion of the *South Seattle to Everett WSDOT Freeway Core HOV Lane Project and Plan* (WSDOT 1997) by constructing northbound and southbound HOV lanes along I-5 within incorporated Everett. The project will also include construction of other elements needed to support construction and operation of the HOV lanes.

The Wetland/Biology Technical Report describes the wetlands within the I-5 Everett HOV area (Sheldon & Associates 2004). A total of 25 wetland areas were delineated within the project area, which includes the I-5 corridor, the Lowell slide area, and six proposed stormwater facilities. Direct wetland impacts from filling will occur at one of these water quality sites during construction. Approximately 0.04 acres of direct wetland impacts are anticipated to occur at Water Quality Site #1 for the proposed stormwater facility.

This final wetland mitigation plan has been prepared to compensate for these wetland impacts. The outline and content of this report is based on *Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals* (Ecology et al. 1994). The following section describes the project location, the responsible parties, and a project description.

1.1 Project Location

The I-5 Everett HOV project extends approximately five miles between SR 526 and SR 2 in the northbound I-5 direction, and East Marine View Drive in the southbound I-5 direction, within the City of Everett, Washington (Figure 2). There are five interchanges within the I-5 Everett HOV project area (interchanges at SR 99, SR 526, SR 527, Broadway/41st Street, and SR 529/Pacific Avenue) that serve the urban/residential communities of south Everett, the Boeing Everett Facility, Paine Field, suburban Snohomish County, and the Everett Mall. The Snohomish River parallels the eastern side of I-5 in the project area.

1.2 Responsible Parties

1.2.1 Responsible Agency

Washington State Department of Transportation
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Telephone (206) 440-4612

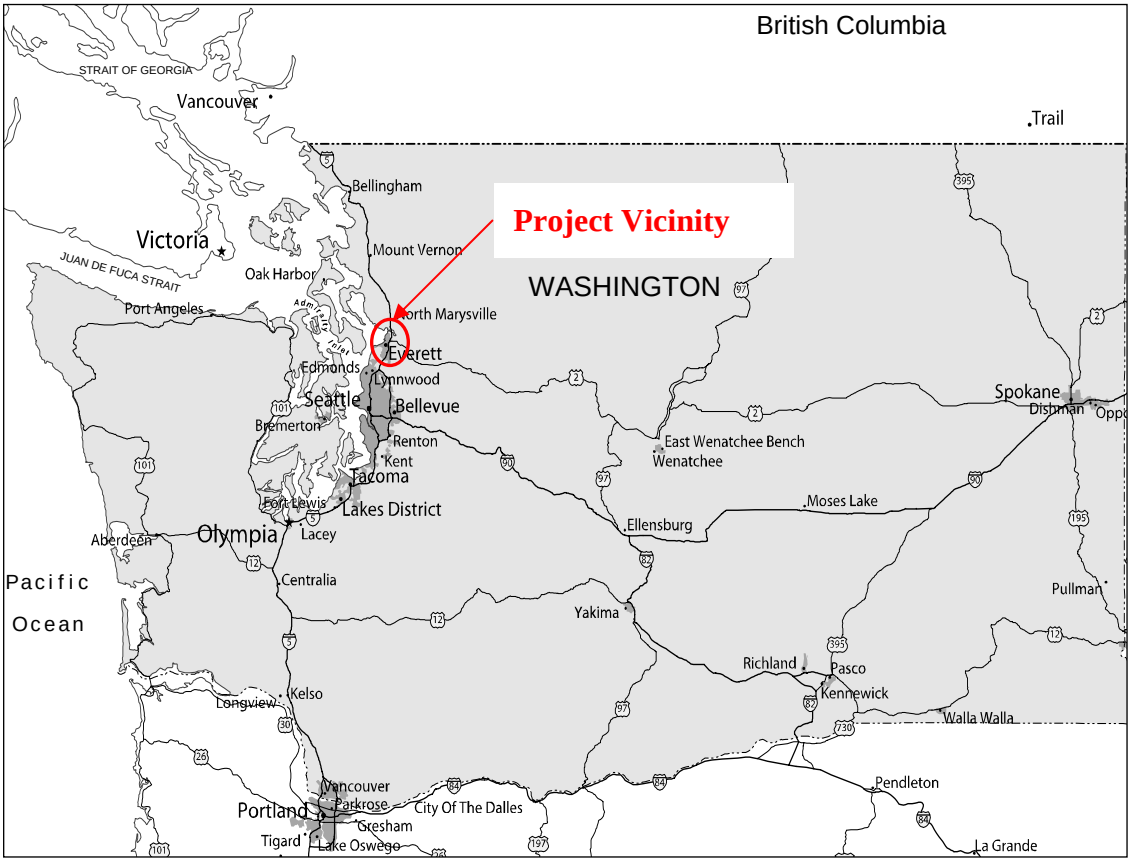

Figure 1. Everett HOV Project Location

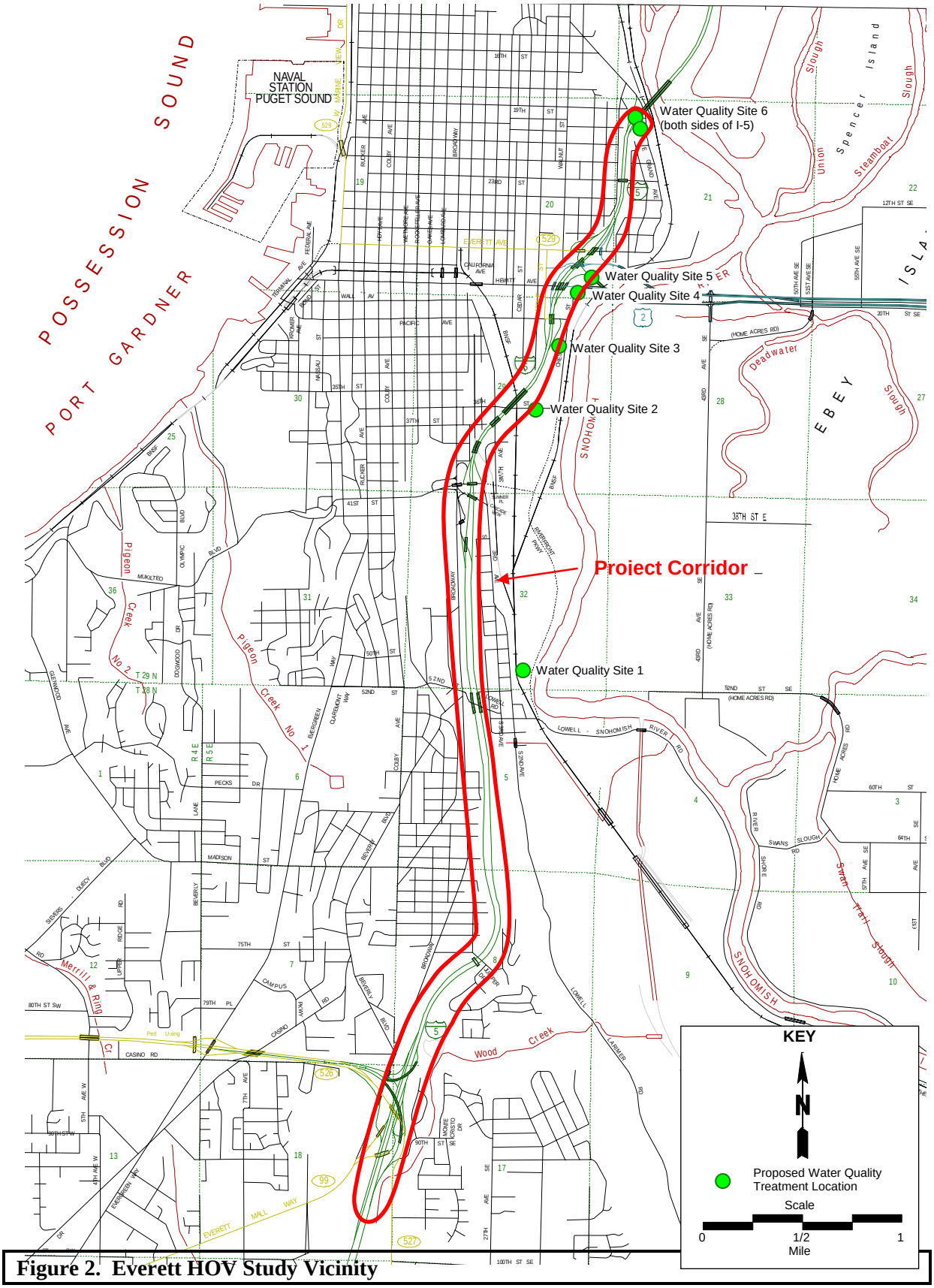

Figure 2. Everett HOV Study Vicinity

1.2.2 Preparer of this Wetland Mitigation Plan

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1.3 Project Description

The following project description provides information on existing conditions in the I-5 corridor and interchanges, and the proposed action. Additional information on the project is provided in the environmental assessment prepared for this project (WSDOT 2004a).

1.3.1 Existing I-5 Corridor

The I-5 corridor between SR 526 (milepost 189.3) and SR 2 (milepost 194.3) in the northbound direction, and between SR 526 (milepost 189.3) and East Marine View Drive (milepost 194.8) in the southbound direction, generally consists of three general-purpose lanes in each direction. A fourth auxiliary lane extends northbound between SR 526 and the left-side Broadway off-ramp, in the southbound direction between the East Marine View Drive on-ramp and the SR 2/Everett Avenue off-ramp, and the Broadway on-ramp and the SR 526 off-ramp. There are currently no HOV facilities on the mainline in the project area. I-5 serves interstate and regional traffic, and provides a connection for Everett-area traffic. The I-5 Everett HOV project area includes urban and suburban development in central Snohomish County. Major trip generators include: the Everett Naval Station, Port of Everett facilities, Memorial Stadium, Boeing's Everett facility, the Everett Mall, employment at the City of Everett and Snohomish County, and two golf courses. Residential development includes single and family, as well as high and medium-density housing developments (WSDOT 2004a).

1.3.2 Existing Interchanges

There are five interchanges with I-5 in the project area. The first I-5 interchange with SR 99, SR 526, and SR 527 serves the urban residential communities of south Everett, the Boeing Everett Facility, Paine Field, suburban Snohomish County, and the Everett Mall. The second I-5 interchange at Broadway/41st Street serves residential and commercial traffic from central Everett, Everett Transit Center, the suburban community of Mukilteo, Memorial Stadium, and some industrial traffic from Everett's riverfront area. The third I-5 interchange at SR 529/Pacific Avenue serves downtown Everett, the Port of Everett, and industrial traffic to Everett's riverfront area. The fourth I-5 interchange at SR 2 interchange serves the communities of Lake Stevens, Snohomish, and Monroe. This interchange serves downtown Everett in a limited capacity, with a connection to northbound I-5 from Everett Avenue and a connection to eastbound SR 2 from Hewitt Avenue. The fifth I-5 interchange at East Marine View Drive and Grand Avenue serves north Everett south of the Snohomish River and the Everett Homeport.

1.3.3 Description of Proposed Action

The I-5 Everett HOV project includes the following improvements to support construction and operation of the facility. The project includes widening or replacement of several bridges on I-5 that cross-over city streets and railroad tracks.

- Constructing auxiliary lanes
- Reconstructing ramps and moving the non-standard left-side northbound off-ramp at Broadway to a right-side off-ramp
- Converting the existing northbound off-ramp to HOV-only and adding a southbound HOV-only on-ramp in that area
- Retrofitting drainage facilities to provide detention and treatment for the entire I-5 facility within the project limits
- Providing the environmental mitigation needed to support the project.

Southbound I-5 Improvements

The proposed action will add an HOV lane, starting near the East Marine View Drive/Grand Avenue on-ramp and continuing through the SR 526 interchange to tie into the existing southbound HOV lanes south of the interchange. An auxiliary lane will be constructed from the southbound SR 2 on-ramp to the Broadway on-ramp. This will require modifying the Broadway on-ramp to a merge condition, rather than an add-lane condition. New retaining walls will be required in several locations to accommodate the widening, and several overpass-underpass structures will require modification or replacement to allow for the additional width to I-5.

Northbound I-5 Improvements

The proposed action will construct an HOV lane that extends the existing lane from south of SR 526 and terminates approximately 1,500 feet before the SR 2/Everett Avenue on-ramp. An auxiliary lane will be constructed from the northbound 41st Street on-ramp to the SR 2 off-ramp. This will require the construction of an additional lane through the interchange and modification of the SR 2/Everett Avenue on-ramp from an add-lane condition to a merge condition. New retaining walls will be required in several locations to accommodate the widening, and several overpass-underpass structures will require modification or replacement to allow for the additional width to I-5.

The existing left-side off-ramp at Broadway does not meet design guidelines, which call for general-purpose vehicles to enter-exit the interstate from the right lane. This will be addressed by constructing a northbound right-side off-ramp for general-purpose traffic. The existing left-side off-ramp will be converted to an HOV direct-access ramp to Broadway. General-purpose traffic will use the new right-side off-ramp. Relocation of the left-side off-ramp to northbound I-5 will eliminate the HOV-general-purpose weaving operations that occur when general-purpose traffic uses the left-side off-ramp. This design will also improve HOV operations by allowing HOV-lane continuity through the project area. This configuration will bring a non-conforming exit up to design guidelines by moving the left-side off-ramp to the right side of I-5. The proposed Broadway off-ramp is consistent with the preliminary alternatives developed by the City of Everett for reconstructing the 41st Street interchange, and is included in the access modification study currently underway for that project.

Interchanges

Ramp alignments at Broadway, 41st Street, Pacific Avenue, and SR 2 will be modified to allow for widening of the I-5 mainline. In addition to the construction of new northbound off-ramp connections at Broadway, the southbound on-ramp will be realigned further from the roadway to allow for the mainline widening. A southbound HOV direct-access connection may also be provided in the center of the I-5 right-of-way, by reconfiguring the existing northbound I-5 to Broadway off-ramp for two-directional traffic flow or constructing a ramp on a new alignment. The direct access ramps will take northbound HOV traffic off of I-5 and southbound HOV traffic from Broadway directly onto I-5.

The 41st Street to I-5 northbound on-ramp will be realigned to the east between the ramp and terminal intersection and mainline I-5, where it will connect as an add-lane and begin the new auxiliary lane that will continue to the SR 2 off-ramp. The southbound off-ramp to 41st Street will be similarly realigned to the west and will not require modifying the ramp terminal intersection. These improvements will be constructed entirely within existing right-of-way.

At Pacific Avenue, the northbound off-ramp will be realigned further to the east to account for the widening of I-5 northbound by two lanes in this area. The ramp terminal intersection will not be affected by the shift in alignment. In the southbound direction, the ramp terminal intersection may have to be shifted west, to account for southbound I-5 widening and realignment of the southbound on-ramp.

At SR 2, the northbound off- and on-ramps will have to be realigned to match the widened I-5 mainline. The realigned northbound off-ramp will function as the drop lane for the auxiliary lane proposed as part of this project. In the southbound direction, the southbound on-ramp will require similar realignment. The ramp and terminal intersection will not be affected by the shift in ramp alignments.

Drainage Features

A complete retrofit of I-5's stormwater collection and drainage system within the project limits will be provided to exceed the WSDOT Highway Runoff Manual's water quality treatment requirements for this project. The drainage features are described in greater detail in the *I-5 Everett HOV–Draft Stormwater Discipline Report* (WSDOT 2004b). The improvements will include constructing a new drainage collection system from the south project limit to Lowell-Larimer Road, and a combination of upgrading and replacing the existing drainage system from Lowell-Larimer Road to the northern project limit.

All stormwater runoff from I-5 between the project southern limit and approximately Lowell-Larimer Road will be collected and piped northward. It will be piped downhill in the Lowell-Larimer Road vicinity to the Snohomish River Valley, treated to meet Highway Runoff Manual stormwater treatment requirements, and released into the Snohomish River through a reconstructed outfall in an existing location. The creation of a stormwater treatment wetland to provide enhanced treatment will occur at Water Quality Site #1.

Stormwater north of Lowell-Larimer Road will be collected and routed to one of five locations depending on the roadway collection site. Stormwater along this stretch of I-5 currently is discharged directly to the Snohomish River with no water quality treatment. The I-5 Everett HOV project will construct several stormwater treatment facilities both within state right-of-way and on acquired property to treat the runoff from I-5. The facilities will be designed to meet Highway Runoff Manual stormwater treatment requirements. The water will then be discharged into the Snohomish River through existing outfalls.

Off-site Construction

In addition to stormwater facilities, activities to improve slope drainage and stability east of I-5 and south of Lowell-Larimer Road may be included in the project. Since construction of I-5, there has been a history of drainage and stability problems on the downhill slope east of I-5 between mileposts 189 and 191. This project will evaluate options to provide a long-term improvement to slope drainage and stability in this area. Improvements may include a new drainage system, repair or enhancement of the existing system, and soil stabilization.

2.0 PROJECT IMPACTS

Direct, indirect, and operational impacts to wetlands and Waters of the U.S. will occur as a result of construction and operation of the proposed stormwater facility at Water Quality Site #1, which are illustrated in Figure 3 and described below. Table 1 summarizes the wetland classifications and buffer widths for Wetlands A and B, as well as the direct wetland impacts. Wetland ratings are recommended here but all wetland ratings are subject to verification by City of Everett staff (City of Everett 2002).

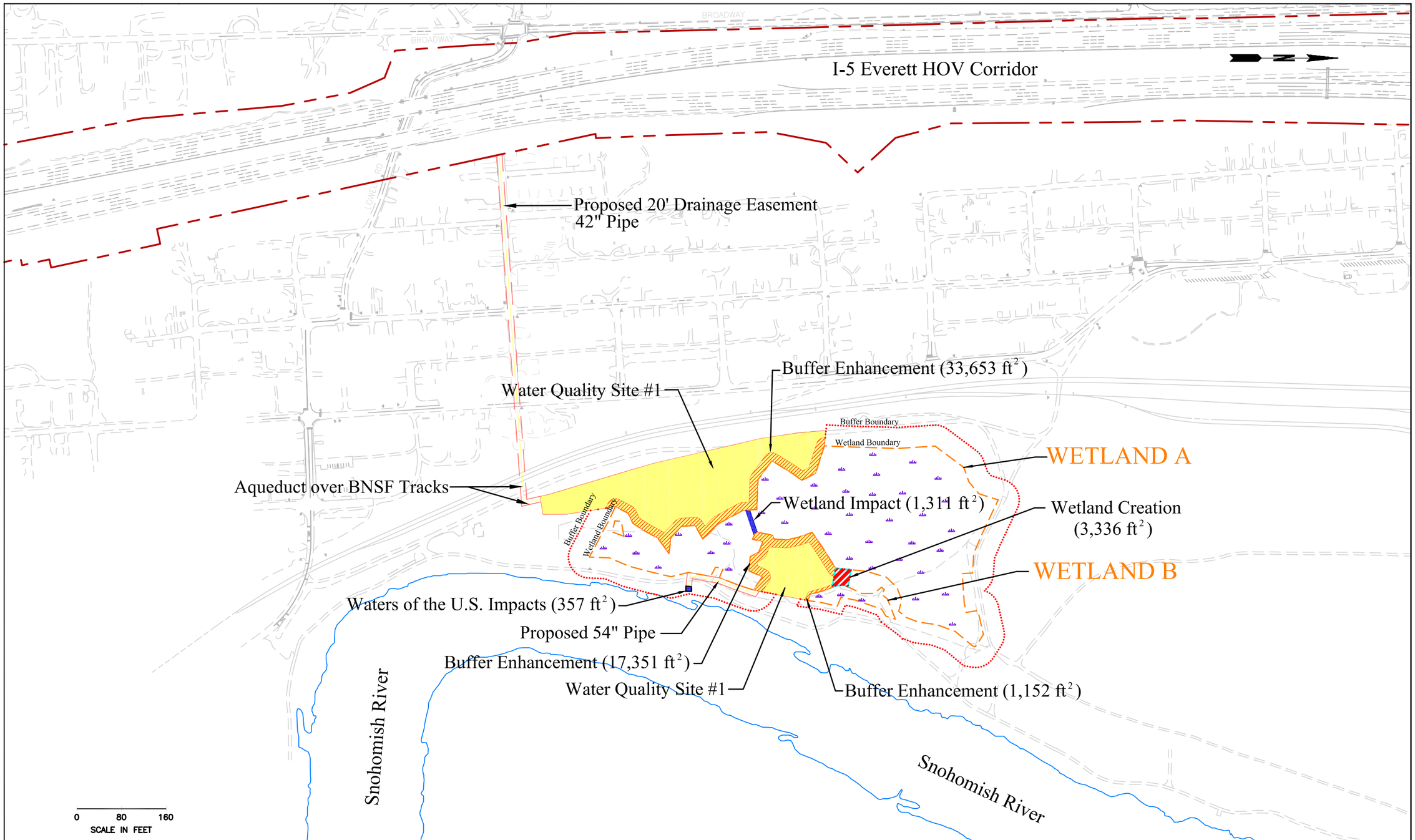
2.1 Direct Impacts

Stormwater collected from both the existing lanes of I-5 and the proposed HOV lanes in the southern half of the project area will be conveyed in a 42"pipe from I-5 through the Lowell neighborhood. This stormwater pipe will be attached to a bridge spanning the BNSF railroad tracks to the Water Quality Site #1 facility. The proposed stormwater facility (Water Quality Site #1) will consist of a meandering series of shallow ponds and bioswales that are contained by low berms (see drawings in Appendix A). This proposed stormwater facility will be located on both the west and east sides of Wetland A and the south side of Wetland B. Minor disturbances will occur in one location within Wetland A to convey the stormwater through an emergent wetland area.

Approximately 1,311 square feet (0.03 acre) of direct impacts to Wetland A are anticipated to occur at Water Quality Site #1 during construction of the proposed stormwater facility. An area dominated by emergent vegetation will be impacted to connect the western and eastern portions of the stormwater facility. This involves installing a 5-foot-wide trough that conveys stormwater through the wetland (see Section F-F' in Appendix A). A 15-foot-wide swath of vegetation will be cleared during construction and annual maintenance may involve pruning of woody vegetation on both sides of the trough.

Approximately 357 square feet (0.01 acre) of direct impacts to a Water of the U.S. will occur at the outlet of the proposed 54" culvert that drains Water Quality Site #1. An energy dissipater pad will be installed at the culvert outlet, which requires filling an existing drainage ditch regulated as a Water of the U.S. This drainage ditch, which drains Wetland A, is currently lined with quarry spalls, and therefore is not regulated as a wetland.

The buffers of Wetlands A and B will be enhanced in three places covering a total area of 52,156 square feet (1.20 acre) during construction of Water Quality Site #1. The City of Everett allows reducing the buffers of Wetlands A and B for the proposed stormwater facility and public trail (City of Everett 2002). Therefore, the Wetland A buffer will be reduced from 75 feet to 29 feet, while the Wetland B buffer will be reduced from 25 feet to 12 feet. A 29-foot-wide portion of the Wetland A buffer will be enhanced in two areas, which includes an approximately 33,653-square foot (0.77 acre) and 17,351-square foot (0.40 acre) area. A 12-foot-wide portion of the Wetland B buffer will also be enhanced in a 1,152-square foot (0.03 acre) area. Most of the buffer area that will be enhanced does not currently function well in providing a sound and visual barrier for wildlife or in providing water quality treatment of stormwater.



FILE NAME							Washington State Department of Transportation	WATER QUALITY SITE 1 WETLAND AND BUFFER IMPACTS AND MITIGATION
TIME			REGION NO.	STATE	FED.AID PROJ.NO.			
DATE			10	WASH				
			JOB NUMBER					
DESIGNED BY	D. GRESHAM						Sheldon & Associates, Inc	FIGURE 3
ENTERED BY	T. STEWART		CONTRACT NO.		LOCATION NO.			
CHECKED BY	D. GRESHAM							SHEET OF SHEETS
PROJ. ENGR.								
REGIONAL ADM.		REVISION DATE BY						

Table 1. Wetland Characteristics at Water Quality Site #1 for the I-5 Everett HOV Project.

Wetland	Area (acres)	USFWS Classification[a]	Ecology Wetland Category[b]	Everett Wetland Category[c]	Everett Buffer Width (feet)[c]	Wetland Impacts (ft^2)	Buffer Enhance-ment (ft^2)
A	10.2	PFO/PSS/PEM	II	2	75 feet	1,311	51,004
B	0.3	PEM	III	4	25 feet	-	1,152

[a] USFWS classification of wetlands is based on Cowardin et al. (1979).
[b] Ecology wetland category of wetlands is based on Ecology (1994).
[c] Everett wetland category and buffer width according to City of Everett (2002).

Approximately 527 square feet (0.01 acre) of impacts to two drainage ditches will occur along the shoulder of I-5 during the HOV lane widening. These drainage ditches are regulated as Waters of the U.S. by the Corps of Engineers because they contain a bed and bank, have an ordinary high water mark, and signs of scour (WSDOT 2004c). However, these impacts are mitigated separately by retrofitting the stormwater facilities in the project corridor and are not addressed further in this wetland mitigation plan.

Clearing of vegetation in both wetland and upland areas may affect wildlife habitat in the immediate area. This involves removing vegetation used by wildlife for foraging, breeding, and nesting. Noise and human disturbances may also temporarily displace wildlife in the immediate vicinity of the construction site. All existing wetlands and buffers will be marked with orange construction fencing prior to the start of construction to prevent additional impacts.

Construction impacts to Wetlands A and B that could potentially occur include: discharge of silt-laden runoff to wetlands and sediment deposition in the wetlands from earthwork occurring in adjacent areas. The likelihood of these impacts occurring will be reduced through the use of mitigating measures such as erosion control, silt fencing, and timing restrictions.

Accidental spills of fuel, oils, chemicals, and concrete leachate used during construction could enter the wetlands. For accidental spills of fuel or other petroleum products, the potential impacts will be highly dependent on the effectiveness of containment and cleanup procedures.

2.2 Indirect Impacts

Indirect impacts to Wetlands A and B may occur from altering hydrological connections. This includes the 5-foot-wide trough that conveys stormwater between the two portions of Water Quality Site #1 and construction of the wetland creation site.

- This trough may affect hydrological connections of surface water that sheet flow through Wetland A. This impact will be minimized by either installing a permeable rock pad or placing perpendicular culverts underneath the trough to allow surface water passage.

- Creation of a wetland area between Wetlands A and B will improve surface water movement between these two wetlands.

2.3 Operational Impacts

Long term operational impacts to Wetlands A and B from Water Quality Site #1 include impacts from public access and routine maintenance. Pedestrian trails following the berms within Water Quality Site #1 will allow public access within the wetland and buffer areas that could disturb wildlife. Routine maintenance of Water Quality Site #1 to remove accumulated sediment in the bioswale will periodically disturb wildlife.

3.0 ECOLOGICAL ASSESSMENT OF IMPACT SITE

An ecological assessment of the wetlands impacted by the I-5 Everett HOV project is described below. Included is a description of the landscape position of Wetlands A and B and their existing vegetation, hydrology, and soils. A description of the wetland buffers and wetland functions and values is also presented below. Photographs of wetland and buffer areas are included in Appendix B.

3.1 Wetland Descriptions

The two wetlands impacted by the proposed project (Wetlands A and B) are located in the City of Lowell near the Snohomish River. Lowell River Park, managed by the City of Everett, is located between the wetlands and the Snohomish River. The wetlands were rated per the classification system described in the Everett Municipal Code Title 19.37.090 (City of Everett 2002).

3.1.1 Wetland A

Wetland A is an approximately 10.2-acre wetland located between the Burlington Northern/Santa Fe (BNSF) railroad tracks and the Snohomish River. A pedestrian path in Lowell River Park that follows a levee dike defines the eastern edge of this wetland. This area was historically used by Simpson Timber Company as a lumber mill, which was removed approximately 20 years ago (Pentec 1994). This area is contaminated with hazardous waste such as heavy metals, petroleum hydrocarbons, and chlorinated solvents (Shannon and Wilson 2004). This site has several abandoned roads and building sites with compacted fill material that perch water near the surface. Due to topographic variation, this palustrine wetland consists of a mosaic of forested, scrub/shrub, and emergent classes (Cowardin et al. 1979).

The tree canopy in this wetland is dominated by red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), and Pacific willow (*Salix lucida var. lasiandra*). The shrub layer is comprised of Sitka willow (*Salix sitchensis*), hardhack (*Spiraea douglasii*), red-osier dogwood (*Cornus sericea*), and Himalayan blackberry (*Rubus armeniacus*). Common herbaceous species include reed canarygrass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), common cattail (*Typha latifolia*), small-fruited bulrush (*Scirpus microcarpus*), field horsetail (*Equisetum arvense*), slough sedge (*Carex obnupta*), purple loosestrife (*Lythrum salicaria*), broadleaf water-plantain (*Alisma plantago-aquatica var. americanum*), and bittersweet nightshade (*Solanum dulcamara*).

A total of six soil pits selected as paired data plots were examined to determine the boundary of Wetland A. These soils resemble the urban land soil type mapped for this area (USDA 1983). Soils along the east central edge of the wetland consisted of compacted silty gravels that perch water. Soils were 10YR 4/1 and 2.5Y 3/1, which meet the criteria for hydric soil (USDA 2001). Soils in the adjacent upland also along the east central edge were 10YR 2/2 but lacked mottling. Soils along the west central portion of the site consisted of gravelly silt that was 7.5YR 4/1 with mottles (10YR 3/6). Soils in the adjacent upland at the center of the site were 10YR 2/2 sandy silt and concrete debris.

Soils located in the northwest corner of the site were 10YR 3/1 gravelly silt with mottles (10YR 3/6). Soils in the adjacent upland also located at the northwest corner of the site were 10YR 3/2 sandy silt with mottles.

This wetland receives its hydrology from a high groundwater table and stormwater that is perched above the compacted fill material. Signs of hydrology range from standing water several feet deep to saturated soils within the top 10 inches. Indicators of hydrology, hydric soil, and the dominance of hydrophytic vegetation were used to delineate this wetland.

3.1.2 Wetland B

Wetland B is an approximately 0.32-acre wetland located between Wetland A and the pedestrian path following the levee dike in Lowell River Park. This palustrine emergent wetland is perched over an abandoned road of compacted fill material. Common herbaceous species include reed canarygrass, soft rush, common cattail, field horsetail, broadleaf water-plantain, and creeping spikerush (*Eleocharis palustris*). The edge of the wetland also contains shrubs such as black cottonwood saplings, Sitka willow, and Himalayan blackberry.

Two soil pits were examined to determine the boundary of Wetland B. Soils within the wetland consisted of compacted silty gravels that perch water. Soils were 10YR 2/1, which meet the criteria for hydric soil (USDA 2001). Soils in the adjacent upland at the center of the site were 10YR 2/2 sandy silt but did not have mottling.

This wetland receives its hydrology from stormwater runoff in the immediate area. Signs of hydrology consisted of saturated soils within the top 10 inches. Indicators of hydrology, hydric soil, and the dominance of hydrophytic vegetation were used to delineate this wetland.

3.2 Buffer Description

The buffer surrounding Wetlands A and B at Water Quality Site #1 is dominated by upland grasses and invasive shrubs due to past disturbances and compacted fill material that create poor growing conditions. The buffer along the south and west edges of Wetland A is dominated by scattered clumps of black cottonwood saplings and Sitka willow, Himalayan blackberry, Scot's broom (*Cytisus scoparius*), upland grasses, reed canarygrass, and weeds.

The buffer along the east edges of Wetlands A and B consists of a narrow strip of vegetation along the levee dike that is dominated by red alder, black cottonwood, Himalayan blackberry, Scot's broom, upland grasses, and weeds. The buffer along the north edge of Wetland A consists of a narrow strip of vegetation along a gravel road that is dominated by red alder, Himalayan blackberry, Scot's broom, upland grasses, and weeds.

3.3 Wetland Function Assessment

Wetlands perform various functions such as reducing flooding, purifying water, exchanging groundwater, minimizing shoreline erosion, providing wildlife habitat, and offering cultural-recreational values. A wetland function assessment was conducted for both Wetlands A and B within Water Quality Site #1 using the *Wetland Functions Characterization Tool for Linear Projects* (WSDOT 2000). This WSDOT methodology identifies the hydrogeomorphic classification of the wetland being assessed, as adapted from Hruby et. al. (1999). Both Wetlands A and B are classified as depressional flow-through wetlands.

Wetlands A and B were formed when surface water was retained and perched over compacted fill material. However, Wetland A provides many more functions than Wetland B based on its size and vegetation complexity. Neither of these wetlands is associated with streams and therefore do not have the opportunity to perform erosion control functions.

Wetland A provides functions for flood flow alteration, sediment removal, and nutrient/toxicant removal because of its depressional topography. This wetland slows and collects water, allowing sediment and toxicants to be removed. Wetland A produces moderate amounts of organic matter and has an outlet to the Snohomish River. Wetland A provides general habitat functions due to its mosaic of vegetation types and canopy structure. Because Wetland A has seasonal ponding, a forested canopy, and connectivity to upland habitats, it provides habitat for invertebrates, amphibians, mammals, and birds. Wetland A is likely to provide educational or scientific value given its proximity to a public park and public ownership. This wetland does not provide any uniqueness or heritage functions.

Wetland B only provides functions for general habitat suitability, wetland-associated birds, and native plant richness. This is based on its seasonal hydrology, diversity of emergent species, and proximity to adjacent habitats.

4.0 MITIGATION APPROACH

This section describes the mitigation approach that was used to determine the type of wetland mitigation needed. The mitigation approach is based on a hierarchy of avoiding and minimizing impacts through careful design and compensating for unavoidable adverse impacts (Ecology et al. 1994). The mitigation process began with efforts to avoid and minimize impacts to wetlands from the I-5 Everett HOV project. Design refinements were considered and incorporated where feasible to reduce the potential loss of existing wetland and stream habitat.

4.1 Impact Avoidance

Impacts were avoided by modifying the design of the proposed stormwater facility at Water Quality Site #1 to minimize filling of existing wetlands. The design and placement of the stormwater facility was adjusted to use upland areas and avoid wetland disturbance. The impact of the conveyance channel crossing Wetland A was minimized by using a 5-foot-wide trough. In addition, the upland buffers that will be used for the proposed stormwater facility were selected based on their poor functions. Low berms will be installed surrounding the stormwater facility to avoid additional impacts to the existing wetland rather than between two berms.

4.2 Impact Minimization

Potential impacts to Wetlands A and B during construction of the proposed stormwater facility will be mitigated by using Best Management Practices (BMP) and following Temporary Erosion and Sediment Control (TESC) measures. Construction fencing at the proposed stormwater facility will be installed to indicate the limits of the earthwork and silt fencing will also be installed adjacent to all wetlands. All areas that are cleared of vegetation and that remain un-worked for several days will be stabilized per approved erosion control measures. Additional BMP and TESC measures will be implemented during construction to prevent impacts to water bodies within the project area. Areas within wetland buffers that were temporarily cleared of vegetation will be revegetated.

To minimize impacts to wetland habitat the following BMPs are recommended:

- Prior to construction, the limits of clearing shall be clearly marked with orange construction fencing and approved erosion control devices shall be placed to prevent runoff into wetland areas.
- All washwater associated with construction should be contained to prevent runoff into adjacent wetlands.
- All refueling operations should be conducted distant from the wetlands, and a spill prevention and control plan should be prepared to avoid any accidental spills.
- Following completion of earthwork activities, all exposed soils will be stabilized by application of an approved hydroseed mixture.
- All cleared areas will be revegetated.
- All stockpiles should be covered with impervious materials when left unattended or during rain events.
- Construction access roads from the site should be constructed using quarry spalls overlying geotextile fabric to prevent movement of sediment from vehicle tires onto roadways.

4.3 Compensatory Wetland Mitigation

The replacement ratios used to calculate the amount of compensatory mitigation required for 1,311 square feet (0.03 acre) of impacts to a Category II wetland and 357 square feet (0.01 acre) of direct impacts to Waters of the U.S. is based on the implementing agreement between WSDOT and the Washington Department of Ecology (WSDOT 1993).

These replacement ratios for in-kind mitigation are based on: the category of wetland impacted; and the proposed category of the wetland that will be created, restored, or enhanced once all of the performance standards have been met (Ecology 1993). Impacts to wetlands can be mitigated with creation/restoration or a combination of creation and restoration plus enhancement. Per the Governor's Executive Order 90-04 (Protection of Wetlands: "No Net Loss" Order) and WSDOT Directive 31-12 (Protection of Wetlands Action Plan), WSDOT is required to mitigate for wetland impacts at a minimum 1:1 ratio (area created/restored to area filled).

The replacement ratio for impacts to Category II and Category III wetlands are 2:1 and 1-1.5:1, respectively as recommended by Ecology. These ratios are dependent on the creation or restoration of a Category II wetland. For creation or restoration of a Category III wetland, the ratios will be 3:1 and 1.5-2:1 for impacts to Category II and Category III wetlands, respectively. Once the 1:1 no net loss ratio has been met, wetland enhancement can be used at a ratio roughly twice as large as the creation or restoration ratio.

Based on the implementing agreement between WSDOT and Ecology, 3,336 square feet (0.08 acres) of mitigation is required for this project based on creation of a Category II wetland. Creation of a wetland at this mitigation site will result in an opportunity for the development of a wide variety of ecological functions. Creation of wetland habitat will result in an increase in hydrophytic vegetation that provides nesting sites, cover, and food for aquatic life including aquatic insects, waterfowl, and smaller animals. The plant community will also provide a forested canopy that improves water quality by reducing water temperatures and algal populations through shading.

According to City of Everett (2002) requirements, the replacement ratio required for impacts to a Category 2 wetland is based on the vegetation class. Although Wetland A has a forested class, the plant community that will be impacted is a combination of scrub/shrub and emergent classes. Based on the highest strata (scrub/shrub), a replacement ratio of 1.5:1 would be required. Because, this is lower than the replacement ratios recommended in the implementing agreement between WSDOT and Ecology, a more conservative approach has been pursued.

4.4 Compensatory Buffer Mitigation

The buffers surrounding Wetlands A and B will be enhanced in three areas. The southwest and east central portion of the Wetland A buffer will be enhanced in two areas, which includes an approximately 33,653 square foot (0.77 acre) and 17,351 square foot (0.40 acre) area. The southwest corner of the Wetland B buffer will also be enhanced in a 1,152 square foot (0.03 acre) area. This buffer enhancement (1.20 acre) will occur by planting native woody species, which improves the buffer functions in protecting the wetlands.

5.0 MITIGATION SITE PLAN

Design of the wetland mitigation site at the proposed stormwater facility is described below. This on-site mitigation area will be used for 0.08 acres of wetland creation and 1.20 acres of buffer enhancement. This includes a description of the ownership, ecological assessment, rationale for choice, proposed design, goals and objectives, and interim performance measures and success standards. Representative photographs of existing conditions at the mitigation site are provided in Appendix B.

5.1 Ownership

The City of Everett owns the property where the proposed stormwater facility and mitigation site will be located. WSDOT is currently purchasing an approximately 13-acre portion of this property in order to site their facilities.

5.2 Ecological Assessment of Mitigation Site

The following ecological assessment of the mitigation site describes existing vegetation, water regime, and soils in the wetland creation and buffer enhancement areas.

5.2.1 Existing Vegetation

The existing vegetation occurring on the wetland creation site consists of Himalayan blackberry, Scot's broom, and upland grasses. Existing vegetation within the two areas where buffer enhancement will occur includes reed canarygrass, Himalayan blackberry, Scot's broom, and upland grasses.

5.2.2 Existing Water Regime

The proposed wetland creation area will receive hydrology from a high groundwater table and precipitation. This seasonal source of hydrology influences what plant species can tolerate winter inundation/soil saturation and summer drought.

5.2.3 Existing Soils

Soils within the proposed wetland creation area consist of compacted silty gravels (10YR 2/3) that support a perched water table. These soils provide poor growing conditions because they lack organic matter, are highly compacted, and may contain hazardous waste (Shannon and Wilson 2004).

5.3 Rationale for Choice

Several factors influenced the selection of this wetland mitigation site. The factors considered in selecting the proposed mitigation site are listed below.

- This mitigation site is located in the same drainage sub-basin and near the impacted wetlands and thus will provide on-site mitigation.
- The mitigation site is of the appropriate size and hydrologic condition in order to satisfy local, state, and federal requirements.
- The existing plant community is dominated by Himalayan blackberry and other invasive species that lack species diversity and structural complexity. Supplemental planting of tree, shrub, and emergent species will provide three canopy layers and greater diversity.
- This potential mitigation site consists of an undeveloped area that is easily accessed from roads so no structures will need to be demolished.
- The surrounding area already functions as a wetland in the landscape, and the proposed mitigation will enhance its attributes. Mitigation provides equal or better functional values than those provided by the wetland being replaced. Wetland functions that will be replaced include water quality improvement, stormwater control, ground water recharge, and wildlife habitat.

5.4 Proposed Mitigation Design

The proposed design of this mitigation site involves 0.08 acres of wetland creation and 1.20 acres of buffer enhancement, which are described below.

5.4.1 Wetland Creation

The approximately 1,311 square feet (0.03-acre) of impacts to Wetland A and 357 square feet (0.01-acre) of impacts to Waters of the U.S. will be mitigated on-site through wetland creation at a

replacement ratio of 2:1 for a total area of 3,336 square feet (0.08 acre). Wetland creation will occur by excavating an upland area between Wetlands A and B and planting this area with native vegetation.

Approximately 150 cubic yards of upland soil will be excavated and removed to match the elevation of the surrounding wetlands (13 to 14 feet above mean sea level). Figure 4 illustrates the grading plan for the wetland creation site. The existing ground surface (elevation 15 feet above mean sea level) in this upland area will be lowered 2 feet to an elevation of 13 feet above mean sea level. This excavated soil will be analyzed for hazardous waste concentrations to determine the appropriate disposal site. The underlying soil will be scarified to loosen the compacted fill material. A 6-inch layer of organic compost will then be mixed into the native soil to improve plant growing conditions.

The wetland creation site will be planted with native tree, shrub, and emergent species. Table 2 lists the native plants that will be used for the wetland creation site. This includes four tree, three shrub, and five emergent species that were selected based on their hardiness, availability in nurseries, and tolerance of hydrologic conditions. Figure 5 illustrates the planting plan for the wetland creation site.

The lowest elevations (12 to 13 feet above mean sea level) will be planted with the five emergent species using bare root plugs. These emergent species will be planted in clusters at a spacing of 18 inches on center. The higher elevations (13 to 15 feet above mean sea level) will be planted with clusters of trees and shrubs. The trees will be spaced at 8 feet on center, while the shrubs will be at 4 feet on center.

5.4.2 Buffer Enhancement

The buffer surrounding Wetlands A and B will be enhanced in three areas. The southwest and east central portion of the Wetland A buffer will be enhanced in two areas, which includes an approximately 33,653 square foot (0.77 acre) and 17,351 square foot (0.40 acre) area. The southwest corner of the Wetland B buffer will also be enhanced in a 1,152 square foot (0.03 acre) area. The existing buffer has low species diversity and structural complexity that inadequately protects the wetland from stormwater runoff, noise, and other disturbances. Buffer enhancement involves removing invasive species and supplemental planting of native trees and shrubs. This will improve buffer functions for protecting Wetlands A and B and the wetland creation site.

Construction of Water Quality Site #1 will begin with clearing invasive species (reed canarygrass, Himalayan blackberry and Scot's broom) within the buffer by mechanical means. This plant matter will be removed from the buffer for offsite disposal. Then berms will be created in a sinuous pattern to create the water quality treatment facility. The slopes of the berms will be planted with native tree and shrub species (see drawings in Appendix A).

Stormwater runoff will enter Water Quality Site #1 at the southwest corner of the Wetland A buffer. This stormwater will flow through a bioswale that is 2,425 feet long and averages 20 feet wide. Low berms paralleling this bioswale will create a sinuous path and varying widths. The berms will average 5 feet high with 3:1 slopes. A pedestrian path will be located on some of these berms to provide public access.

WETLAND A

WATER QUALITY SITE #1

BUFFER ENHANCEMENT (17,351 FT²)

PROPOSED CONTOURS

15

14

13

15

15

WETLAND CREATION SITE BOUNDARY

BUFFER ENHANCEMENT (1,152 FT²)

EXISTING CONTOURS

WETLAND B

15

15

WETLAND BOUNDARY

0 10 20
SCALE IN FEET

FILE NAME			REGION NO.	STATE	FED.AID PROJ.NO.
TIME			10	WASH	
DATE			JOB NUMBER		
DESIGNED BY D. GRESHAM					
ENTERED BY T. STEWART					
CHECKED BY D. GRESHAM			CONTRACT NO.		LOCATION NO.
PROJ. ENGR.					
REGIONAL ADM.	REVISION	DATE BY			

Washington State Department of Transportation

Sheldon & Associates, Inc

WATER QUALITY SITE 1
GRADING PLAN FOR
WETLAND CREATION SITE

FIGURE 4

SHEET
OF
SHEETS

PLANT SCHEDULE

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PERCENT OF STRATA
	Fraxinus latifolia	Oregon Ash	24
	Populus balsmifera	Black Cottonwood	24
	Salix lucida	Pacific Willow	24
	Thuja plicata	Western Red Cedar	28
	Cornus sericea	Red-osier Dogwood	38
	Rubus spectabilis	Salmonberry	27
	Salix sitchensis	Sitka Willow	35
	Carex amplifolia	Bigleaf Sedge	12
	Carex obnupta	Slough Sedge	30
	Eleocharis palustris	Common Spikerush	13
	Juncus ensifolius	Daggerleaf Rush	15
	Scirpus microcarpus	Small-fruited Bulrush	30

N

BUFFER ENHANCEMENT (17,351 FT²)

WETLAND A

WETLAND CREATION SITE BOUNDARY

WATER QUALITY SITE #1

BUFFER ENHANCEMENT (1,152 FT²)

WETLAND B

WETLAND BOUNDARY

0 10 20
SCALE IN FEET

FILE NAME					
TIME			REGION NO. 10	STATE WASH	FED.AID PROJ.NO.
DATE					
DESIGNED BY D. GRESHAM			JOB NUMBER		
ENTERED BY T. STEWART			CONTRACT NO.		LOCATION NO.
CHECKED BY D. GRESHAM					
PROJ. ENGR.					
REGIONAL ADM.	REVISION	DATE BY			

Washington State Department of Transportation

Sheldon & Associates, Inc

WATER QUALITY SITE 1
PLANTING PLAN FOR
WETLAND CREATION SITE

FIGURE 5

SHEET OF SHEETS

Table 2. Plant species proposed within the wetland creation site at Water Quality Site #1.

Stratum	Scientific Name	Common Name	Wetland Indicator Status[a]	Percent Compostion by Strata
Tree				
	Fraxinus latifolia	Oregon ash	FACW	24
	Populus balsamifera	Black cottonwood	FAC	24
	Salix lucida	Pacific willow	FACW+	24
	Thuja plicata	Western red cedar	FAC	28
Shrub				
	Cornus sericea	Red-osier dogwood	FACW	38
	Rubus spectabilis	Salmonberry	FAC+	27
	Salix sitchensis	Sitka willow	FACW	35
Emergent				
	Carex amplifolia	Bigleaf sedge	FACW+	12
	Carex obnupta	Slough sedge	OBL	30
	Eleocharis palustris	Common spikerush	OBL	13
	Juncus ensifolius	Daggerleaf rush	FACW	15
	Scirpus microcarpus	Small-fruited bulrush	OBL	30

[a]Wetland indicator status definitions: OBL = obligate, FACW = facultative wetland, FAC = facultative.

Table 3. Plant species that potentially could be used for buffer enhancement at Water Quality Site #1.

Stratum	Scientific Name	Common Name	Wetland Indicator Status[a]	Percent Composition by Strata
Tree				
	Fraxinus latifolia	Oregon ash	FACW	17
	Picea sitchensis	Sitka spruce	FAC	17
	Populus balsamifera	Black cottonwood	FAC	15
	Prunus emarginata	Bitter cherry	FACU	16
	Salix lucida	Pacific willow	FACW+	18
	Thuja plicata	Western red cedar	FAC	17
Shrub				
	Cornus sericea	Red-osier dogwood	FACW	18
	Physocarpus capitatus	Pacific ninebark	FACW-	16
	Rubus spectabilis	Salmonberry	FAC+	18
	Salix hookeriana	Hooker willow	FACW-	15
	Salix scouleriana	Scouler willow	FAC	15
	Salix sitchensis	Sitka willow	FACW	18

[a] Wetland indicator status definitions: FACW = facultative wetland, FAC = facultative, FACU = facultative upland.

The native plants that potentially could be used for buffer enhancement in Water Quality Site #1 are listed in Table 3. This includes six tree and six shrub species that were selected based on their hardiness, availability in nurseries, and tolerance of hydrologic conditions. The banks of the berms in the buffer enhancement area will be planted with clusters of trees and shrubs. The trees will be spaced at 8 feet on center, while the shrubs will be at 4 feet on center. A temporary irrigation system may be needed for these buffer plantings during the first two years to improve survival and growth.

5.5 Goals and Objectives

The proposed mitigation site will be monitored for ten years to demonstrate the provision of intended functions. Goals describe the overall intent of mitigation efforts and objectives describe the individual components of the mitigation site in detail. Interim performance measures and success standards describe specific on-site characteristics that indicate a function is being provided. Interim performance measures are used to guide management of the mitigation site. Success standards are thresholds to be measured during the final year of the monitoring period that demonstrate the site has complied with regulatory requirements and is providing intended functions.

Mitigation Goal #1—Create 0.08 acres of wetland from an upland area between Wetlands A and B.

- **Objective #1—**Clear existing non-native invasive species within this upland area.
- **Objective #2—**Achieve the appropriate elevation to create wetland conditions and match the existing grade in Wetlands A and B adjacent to the site.
- **Objective #3—**Revegetate this 0.08-acre area with native tree, shrub, and emergent species.
- **Objective #4—**Provide functions and values in the created wetland for flood flow alteration, sediment removal, and nutrient/toxicant removal. This involves creating a depression that stores and filters runoff; planting three strata of native plants that provides general habitat suitability, habitat for wetland-associated birds, and native plant richness; and educational and scientific values by creating a mitigation site that can be monitored.

Mitigation Goal #2—Enhance 1.20 acres of buffer in three areas surrounding Wetlands A and B having low plant diversity.

- **Objective #1—**Remove non-native invasive species (reed canarygrass, Himalayan blackberry, and Scots broom) from the three buffer areas.
- **Objective #2—**Plant native tree and shrub species throughout this 1.20-acre buffer in three areas surrounding Wetlands A and B.

5.6 Interim Performance Measures and Success Standards

The following interim performance measures and success standards for hydrology, wetland vegetation, and buffer vegetation will be used.

5.6.1 Hydrology

The mitigation site will possess ground and/or surface water inundation or saturation sufficient to support the wetland site.

Interim Performance Measures

Years 1-10

- The soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 inches below the surface or less, for a consecutive number of days greater than or equal to 12.5% of the growing season. Wetland hydrology will be determined using indicators of wetland hydrology, as listed in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997).

Year 5

- The wetland area will be delineated using current methodology to assure that the mitigation site contains 0.08 acre of created wetland in total.

Success Standards

Year 10

- The wetland area will be delineated using current methodology to assure that the mitigation site contains 0.08 acre of created wetland in total.

5.6.2 Wetland Vegetation

The mitigation site will include a total of approximately 0.08 acre of created emergent and forested wetland vegetation.

Interim Performance Measures

Year 1

- The vegetation will achieve 100 percent survival of planted woody species at the end of the first year plant establishment period. If all dead woody species plantings are replaced, the performance measure will be met.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries (*Rubus* sp.), and Scot's broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.

Year 3

- The native woody species will maintain a minimum density of four plants per 100 square feet in scrub-shrub and forested wetland communities.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.
- Native herbaceous facultative or wetter vegetation will achieve 70 percent coverage in emergent wetland communities. Native colonizing vegetation will be included in this coverage calculation.

Year 5

- Native facultative or wetter woody species will achieve a minimum of 35 percent coverage in the forested wetland community. Native colonizing vegetation will be included in this coverage calculation.

- Native facultative or wetter herbaceous vegetation will achieve 75 percent coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.
- Three facultative or wetter native vegetation woody species each will achieve at least 5 percent or greater relative cover in the forested wetland community.

Year 7

- Native facultative or wetter woody species will achieve a minimum of 50 percent coverage in the forested wetland community. Native colonizing vegetation will be included in this coverage calculation.
- Native facultative or wetter herbaceous vegetation will achieve 75 percent coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.
- Three facultative or wetter native vegetation woody species each will achieve at least 6 percent or greater relative cover in the forested wetland community.

Success Standards

Year 10

- Native facultative or wetter woody species will achieve a minimum of 75 percent coverage in the forested wetland community. Native colonizing vegetation will be included in this coverage calculation.
- Native facultative or wetter herbaceous vegetation will achieve 75 percent coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.
- Three facultative or wetter native vegetation woody species each will achieve at least 8 percent relative cover in the forested wetland community.

5.6.3 Buffer Vegetation

The mitigation site will include a total of approximately 1.20 acres of buffer vegetation.

Interim Performance Measures

Year 1

- The vegetation will achieve 100 percent survival of planted woody species at the end of the first year plant establishment period. If all dead woody species plantings are replaced, the performance measure will be met.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the buffer mitigation area.

Year 3

- The native woody species will maintain a minimum density of four plants per 100 square feet in buffer communities.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the buffer mitigation area.

Year 5

- Native upland buffer woody species will achieve a minimum of 15 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 10 percent coverage in the upland buffer community.
- Three native woody vegetation species each will achieve at least 5 percent relative cover in the buffer community.

Year 7

- Native upland buffer woody species will achieve a minimum of 35 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.
- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the buffer mitigation area.
- Three native woody vegetation species each will achieve at least 6 percent relative cover in the buffer community.

Success Standards

Year 10

- Native upland buffer woody species will achieve a minimum of 50 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.

- Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot's broom will not exceed 15 percent coverage in the buffer mitigation area.
- Three native woody vegetation species each will achieve at least 8 percent relative cover in the buffer community.

6.0 MONITORING PLAN

A monitoring plan will be prepared by WSDOT and implemented annually to evaluate the success of the created wetland mitigation area. The WSDOT Monitoring Program uses the principles of adaptive management to guide monitoring activities. Adaptive management is a process with two key components (Elzinga et al. 1998). One component is that monitoring should only be initiated if opportunities for management change exist. The second component is that monitoring is driven by objectives and the monitoring activities must be designed to determine if the objectives have been achieved. Valid monitoring data is critical to making meaningful management decisions that help the site meet its objectives. Monitoring plans and the WSDOT strategy are based on site conditions and plant community development. These factors, in addition to the objectives are incorporated into a site-specific monitoring plan at the beginning of each monitoring season.

All wetland creation and buffer enhancement areas will be monitored for a minimum of ten years. Formal monitoring procedures will be performed in years one, three, five, seven, and ten after initial acceptance of the mitigation construction. The site would be evaluated informally the summer following installation to evaluate survival rates and to document the presence of any non-native invasive species. The methods presently in use by the WSDOT Wetland Assessment and Monitoring Program are based on standard ecological and bio-statistical methods (WSDOT 2004d).

A monitoring report will be submitted to the U.S. Army Corps of Engineers (Corps of Engineers), Washington State Department of Ecology, City of Everett, and other resource agencies for review and comment for monitoring years one, three, five, seven, and ten. The results of the year two informal monitoring will also be submitted to the Corps of Engineers for review and comment.

7.0 CONTINGENCY PLAN

Based on the data collected during annual monitoring of the mitigation site, it may be necessary to implement contingency measures to ensure that the interim performance measures and success standards are met. These interim performance measures and success standards include expected hydrology, plant survival, vegetation cover, and the amount of invasive species, all of which help define a viable wetland and buffer. Several factors, both artificial and natural, could have detrimental effects on the success of the mitigation site. This includes changes in hydrology from drought or flooding, water pollution from excessive nutrients or toxicants, erosion of soil during flood events, plant mortality from herbivores, and competition from invasive plants.

Construction bonds will be posted by the general and planting contractors selected by WSDOT to construct the proposed wetland mitigation site. The construction bonds will be in the amounts and for the periods of time specified in WSDOT's standard contract agreements, based on the estimated costs of construction and planting of the mitigation site. The construction bond will be released upon

completion of construction and planting of the site, as determined by WSDOT in consultation with the Corps of Engineers.

8.0 SITE PROTECTION

Conservation easements will be established to protect the I-5 Everett HOV mitigation site in perpetuity. The created wetland site and buffer enhancement areas constructed as mitigation for this project shall not be made the subject of a future individual or general Corps of Engineers permit application for fill or other development, except for the purposes of restoring or enhancing the existing wetland for future mitigation needs. In addition, a description of the approved mitigation area and any subsequent permit mitigation area revisions, will be recorded with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records to, or interest in, real property. Proof of this documentation must be provided to the Corps of Engineers, Seattle District no later than 90 days after the date of permit issuance.

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Appendix A - Drawings of Water Quality Site #1

I-5 EVERETT HOV
STORMWATER WETLAND

conceptual plan

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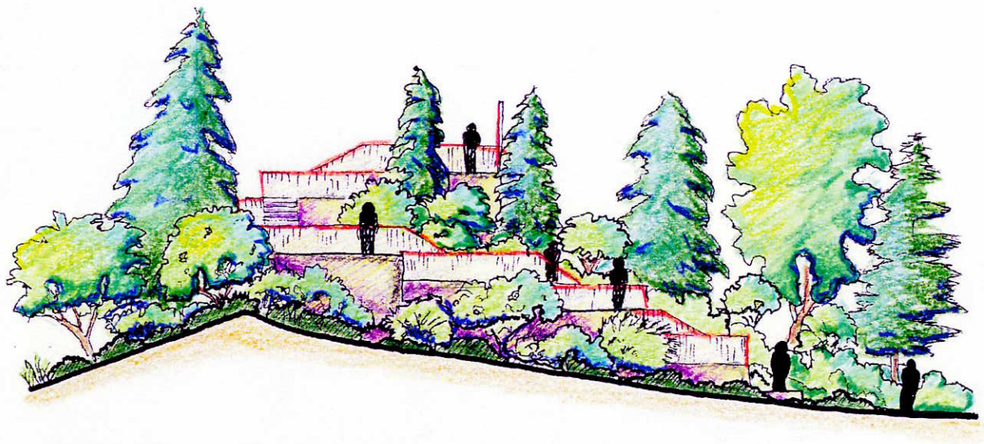
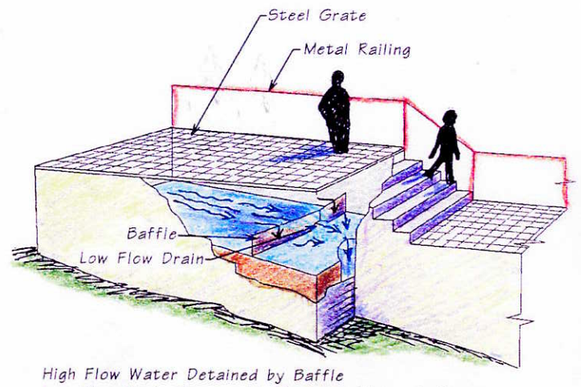


SECTION A - A' - View of Entry Feature from West

Not to Scale

ENTRY FEATURE / FALLS

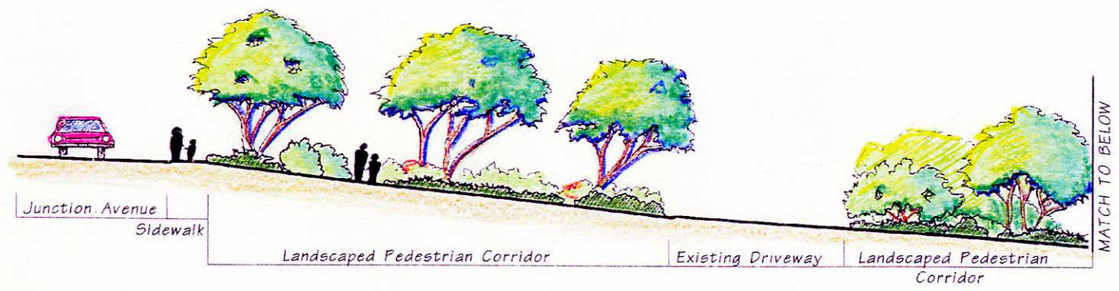
- TRANSPORTS PEOPLE AND STORMWATER 30 FEET DOWN FROM BRIDGE TO BIOSWALE
- DEMONSTRATES STORMWATER VOLUME, VELOCITY, AND WATER QUALITY
- HUMAN-SCALED ENTRY INTO SITE
- SCENIC AND EDUCATIONAL OVERLOOKS TO NATURAL WETLANDS, STORMWATER WETLANDS, AND RIVER
- OPEN GRATES ON CONCRETE BOXES PROVIDE VISUAL AND AUDITORY EXPERIENCE UPON ENTERING THE SITE
- INTEGRATED INTO THE SURROUNDING LANDSCAPE WITH BERMS AND PLANTINGS
- DECREASES VELOCITY OF STORMWATER PRIOR TO ENTERING THE BIOSWALE



High Flow Water Detained by Baffle
Low Flow Drain Ensures No Standing Water in Structure

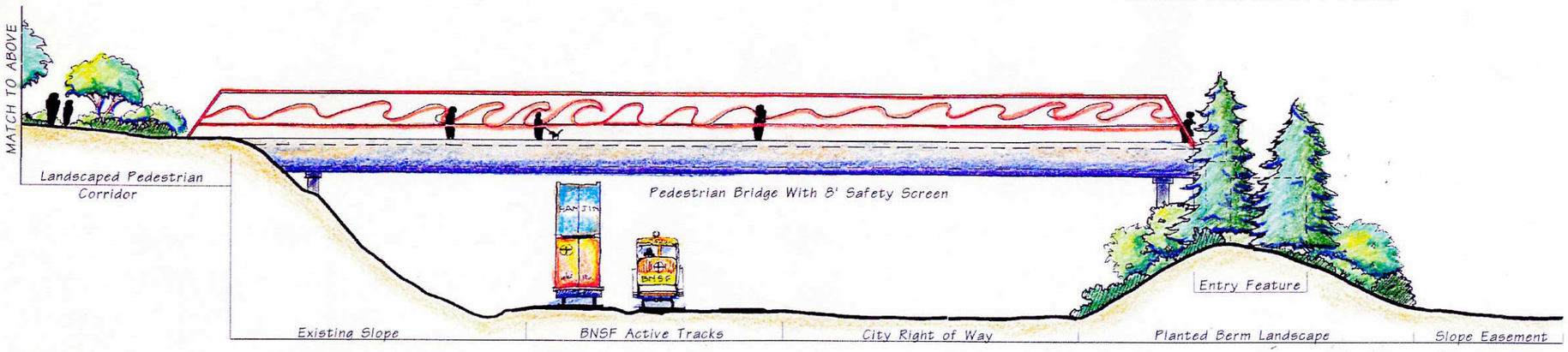
ENTRY FEATURE DETAIL
- Box/Step Conveyance

Not to Scale



BRIDGE

- TRANSPORTS PEOPLE AND STORMWATER FROM MAIN STREET AND JUNCTION AVENUE TO THE STORMWATER WETLAND SITE
- OPPORTUNITY FOR COMMUNITY INVOLVEMENT IN ARTISTIC DESIGN FOR SAFETY FENCE



SECTION B - B' - From Junction Avenue to Entry Feature

Scale: 1 In. = 20 Ft.

See Match Lines

Sheet 2 of 4
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I-5 EVERETT HOV STORMWATER WETLAND

conveyance

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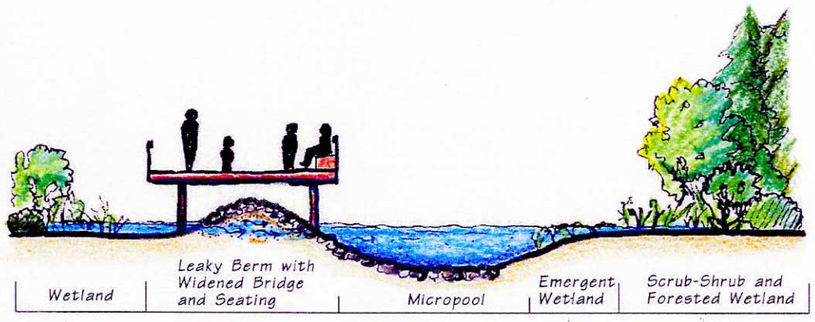


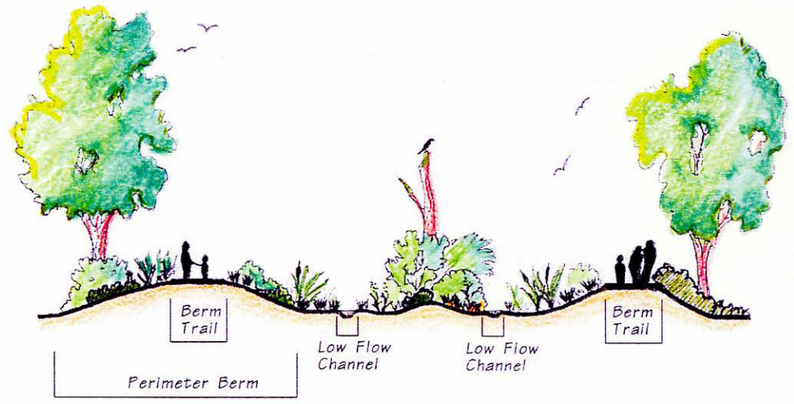
SECTION D - D' - Leaky Berm and Micro-pool

Not to Scale

- BERM AND POOL BOTTOM REINFORCED TO ACCOMMODATE HIGHER FLOW BYPASS CHANNEL.
- LOW FLOW CHANNEL REINFORCEMENT WILL BE HIDDEN BY THE WIDENED BRIDGE VIEWING PLATFORM AND THE WATER LEVELS.

STORMWATER WETLAND FACILITY

- ACCOMMODATES STORMWATER FOR WATER QUALITY TREATMENT AND CONTROLED RELEASE INTO THE NATURAL RIVER SYSTEM
- DESIGNED TO TREAT 6 MONTH STORM EVENT AND BYPASS CAPACITY FOR 50 YEAR STORM EVENTS
- SOIL IS SEALED TO MINIMIZE POSSIBLITY OF INFILTRATION AND MOVEMENT OF STORMWATER CONTAMINANTS
- INCLUDES INTERPRETIVE AND PASSIVE RECREATION TRAIL THROUGH STORMWATER WETLAND TO THE RIVER FRONT TRAIL
- PROVIDES ENHANCED PARK-LIKE ENVIRONMENT AS DUAL USE WITH STORMWATER TREATMENT

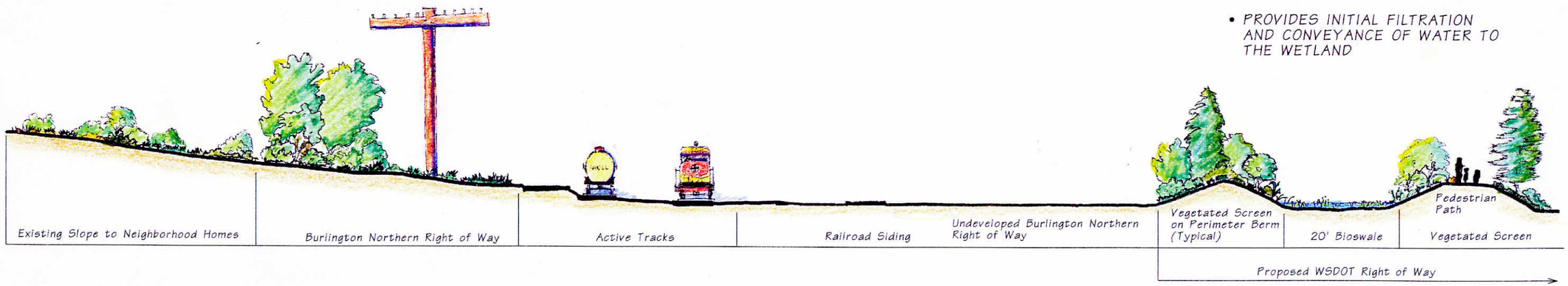


SECTION E - E' - Through the Trail and Swale

Not to Scale

BIOSWALE

- VISUALLY DEMONSTRATES HOW VEGETATION HELPS WATER QUALITY
- ONE BERM IS THE ENTRY TRAIL TO THE WETLAND
- PROVIDES INITIAL FILTRATION AND CONVEYANCE OF WATER TO THE WETLAND



SECTION C - C' - From Train Tracks through Bioswale

Scale: 1 In. = 20 Ft.

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I–5 EVERETT HOV STORMWATER WETLAND

treatment

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CULVERT BRIDGE

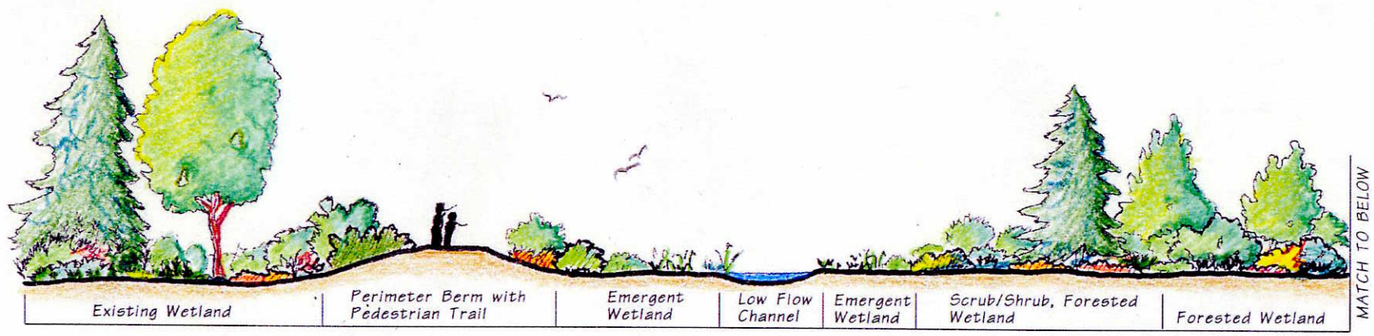
- COLLECTS AND TRANSPORTS STORMWATER AND PEOPLE WHILE MINIMIZING WETLAND IMPACTS.
- PROVIDES A VISIBLE COMPARISON OF WATER VOLUME AND WATER QUALITY FROM THE ENTRY TO THE MID-POINT OF TREATMENT.
- PROVIDES PUBLIC VISIBILITY FOR COMPARISON OF THE NATURAL WETLAND SYSTEM AND STORMWATER WETLAND SYSTEM.
- REPEATS THE MATERIALS OF THE ENTRY FEATURE WHILE INCORPORATING STREAM BED GRAVELS AND EMERGENT PLANTINGS FOR A MORE NATURALIZED LOOK AND TO PROVIDE ROUGHNESS TO SLOW WATER FLOWS.

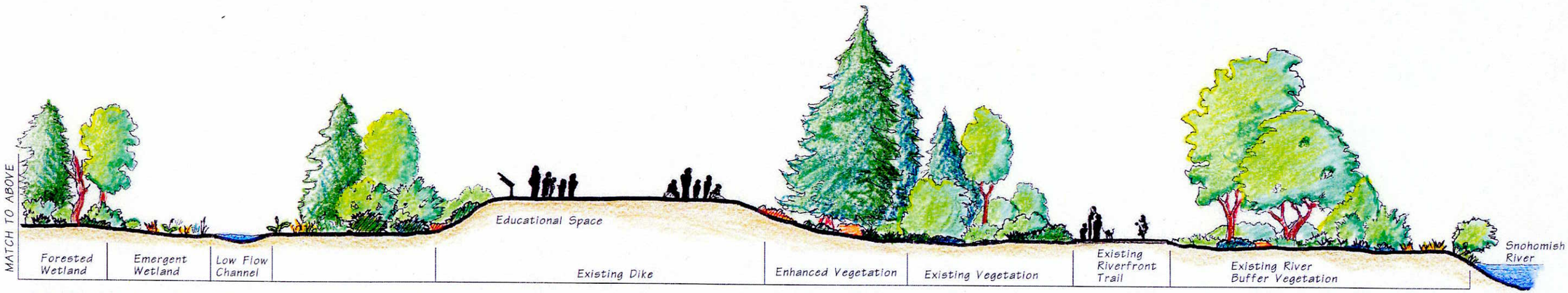
SECTION F - F' - Culvert Bridge

Not to Scale

EDUCATIONAL / INTERPRETIVE AREAS

- WIDENED BOARDWALKS OVER LEAKY BERMS HAVE BUILT-IN BENCHES ON THE BRIDGE
- WIDENED PATH AREAS PROVIDE MULTIFUNCTIONAL SPACES FOR RESTING, GATHERING, EDUCATION AND VIEWPOINTS.
- OPPORTUNITY EXISTS FOR DESIGN OF THE EDUCATIONAL SPACES THROUGH COMMUNITY INPUT





SECTION G - G' - Through Wetland & Dike

Scale: 1 In. = 20 Ft.

See Match Lines

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I-5 EVERETT HOV
STORMWATER WETLAND

treatment

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Appendix B - Site Photos

Photo 1-Overview of Wetland A and buffer along western edge.

Photo 2-Emergent wetland that will be impacted.

Photo 3-Wetland creation site in background and Wetland B in foreground.

Photo 4-Typical view of emergent and scrub/shrub wetland.